



## Probing Action of Botanical Polyphenols on Oxidative and Inflammatory Signaling Pathways in Microglial Cells

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**Many berry species and fruits are enriched in polyphenols and their consumption has been shown to offer health effects including fighting against infectious and inflammatory diseases. In the central nervous system, microglial cells constitute a unique class of immune cells and they exhibit characteristic properties to carry out multifunctional duties in the brain. Our recent studies have focused on signaling pathways underlying microglial response to proinflammatory cytokines and bacterial endotoxin (lipopolysaccharides, LPS).**

**...Using the microglial cell model, botanical phenolic compounds, such as epigallocatechin-gallate (EGCG) from green tea, honokiol from *Magnolia* bark, and even ethanol extract of *Sutherlandia frutescens* (a South African “cancer bush”), showed ability to inhibit oxidative and inflammatory responses in microglial cells through modulating pathways involving ERK1/2. Many species of berries, including elderberries (*S. nigra* subsp. *canadensis*) are enriched in anthocyanins, compounds known to contribute to the purple color of the fruit. Cyanidin-3-glucoside is the most common anthocyanin in the elderberry fruit and has high antioxidant activities. Our study indicated ability for cyaniding-3-glucoside to inhibit IFN $\lambda$ -induced NO and ROS production in microglial cells.**

Using North American elderberries, researchers probed the cell level activity of cyaniding-3-glucoside, one of seven antioxidants present in *S. canadensis*, on microglial cells, which form important signaling pathways in the central nervous system. They want to understand the cell level mechanisms behind the beneficial effects of elderberry anthocyanins in protecting and restoring brain/central nervous system performance. This study explores a specific indirect immune system response mechanism activated by elderberry.